

[0062] The driving transistor T2 is connected to the power source line VDD and the storage capacitor C1 and supplies an output current IOLED that is proportional to the square of a voltage difference of a voltage stored in the storage capacitor C1 and a threshold voltage to the OLED L1, and the OLED L1 emits light according to the output current IOLED. The driving transistor T2 includes a source electrode 32, a drain electrode 34, and a gate electrode 36, and the anode 26 of the OLED L1 may be connected to the drain electrode 34 of the driving transistor T2. As shown in FIGS. 7 and 8, the anode 26 of the OLED L1 is electrically connected to the drain electrode 34 of the driving transistor T2. A configuration of the subpixel is not limited to the above-described example, and can be variously modified.

[0063] Referring back to FIG. 3 to FIG. 6, the second substrate 24 is bonded with the first substrate 20 at a predetermined distance by the seal frit 22 in order to protect the driving circuit units and the OLEDs formed on the first substrate 20 from an outer environment. A moisture absorbing member may be provided inside the second substrate 24.

[0064] On the pad area A20 of the panel assembly 12, an integrated circuit chip 38 is mounted by a chip on glass (COG) method and a flexible printed circuit board 14 is mounted by a chip on film (COF) method. A protective layer 40 is formed around the integrated circuit chip 38 and the flexible printed circuit board 14 to cover pad electrodes (not shown) formed in the pad area A20 for protection. In the printed circuit board (PCB) 16, electron elements (not shown) are provided for processing driving signals and a connector 42 is provided for transmitting external signals to the printed circuit board (PCB) 16.

[0065] A fixing member 18 is formed in a structure that surrounds not only the display area A10 of the panel assembly 12 but also front, and rear, and side surfaces of the panel assembly 12. That is, the fixing member 18 is formed to substantially surround six surfaces of the panel assembly 12. Such a fixing member 18 reduces reflection of external light and functions as an impact-resistant member to reduce the amount of impact transmitted to the panel assembly 12 by protecting the panel assembly 12 from the external environment.

[0066] The fixing member 18 is formed of a polarization layer 44 (refer to FIG. 3) that has a polarization function and an adhesive layer 46 (refer to FIG. 3) that is formed on one side of the polarization layer 44 and disposed to face the panel assembly 12, which adheres the polarization layer 44 to the panel assembly 12. The overall fixing member 18 or a portion that corresponds to the display area A10 has light transmittance, and is made of a polymer resin material or a silicon resin material.

[0067] The fixing member 18 made of polymer resin can be easily bent so that a film sheet can be cut in a size that can covers portions of at least six sides of the panel assembly 12 and the cut fixing member 18 can be bent and attached to the panel assembly 12.

[0068] As shown in FIG. 3, the cut fixing member 18 cut for each sides of the panel assembly 12 includes a first cover portion 181 that corresponds to a rear surface of the first substrate 20, four of second cover portions 182 that respectively correspond to side surfaces of the first and second substrates 20 and 24, and a third cover portion 183 that corresponds to front surfaces of the second substrates and the protective layer 40. The cover portions 181, 182, and 183 are integrally formed.

[0069] Among the four of the second cover portions 182, one cover portion 182 that corresponds to the pad area A20 can have an opening 184 through which the flexible printed circuit board 14 can pass.

[0070] As shown in FIG. 4, the first cover portion 181 is attached to the rear surface of the first substrate 20, the four of the second cover portions 182 are bent from the first cover portion 181 to attach the second cover portions 182 to the side surfaces of the first and second substrates 20 and 24, and the third cover portion 183 is bent from one of the second cover portions 182 to attach the third cover portion 183 to the front surfaces of the second substrate 24 and the protective layer 40.

[0071] In FIG. 3, the four second cover portions 182 are respectively located at four edges of the first cover portion 181, and the third cover portion 183 is connected to one of the second cover portions 182. In this case, ends of the second cover portions 182 match edges of the panel assembly 12, and the fixing member 18 can surround the panel assembly 12 without overlapping other cover portions 181, 182, or 183.

[0072] A shape of the fixing member 18 before being attached to the panel assembly 12 is not restrictive, and it can be variously modified. However, when forming the fixing member 18, a contiguous portion of the fixing member preferably completely covers the display area A10. In addition, the fixing member 18 can be overlap other portions 181, 182, and 183 of the fixing member 18, preferably not in the display area A10, when attached to the panel assembly 12.

[0073] Referring back to FIG. 3 to FIG. 6, a manufacturing method of the OLED display 100 having the above-described configuration can include a first process for making the panel assembly 12 by forming OLEDs and driving circuit units on the first substrate 10 and attaching the first and second substrates 10 and 20 by using a seal frit 22, a second process for mounting the flexible printed circuit board 14 that is connected to printed circuit board 16 on the pad area A20 of the first substrate 10, a third process for preparing the fixing member 18 in size that can surround outer surfaces of the panel assembly 12, and a fourth process for surrounding the panel assembly 12 with the fixing member 18.

[0074] After the fourth process, the flexible printed circuit board 14 is bent to the rear side of the first cover portion 181 to locate the printed circuit board (PCB) 16 in the rear surface of the first cover portion 181 of the fixing member 18. That is, the printed circuit board (PCB) 16 is located to face the rear surface of the first substrate 20, and the fixing member 18 is disposed therebetween.

[0075] As described, the OLED display 100 according to aspects of the present invention is formed in a structure that surrounds six sides of the panel assembly 12 by attaching the fixing member 18 to the panel assembly 12. Unlike a metallic fixing member, the polymer resin fixing member 18 is not broken or damaged by external impact and has excellent impact-absorbing capability. Therefore, when the OLED display 100 is dropped so that external impact is applied thereto, the fixing member 18 absorbs the impact so that the panel assembly 12 can be prevented from being damaged.

[0076] FIG. 9 is an exploded perspective view of an OLED display, FIG. 10 is a perspective view of an OLED display when it is assembled, and FIG. 11 is a cross-sectional view of FIG. 10, taken along the line XI-XI. Referring to FIG. 9 to FIG. 11, an OLED display 110 has the same configuration as the OLED display as described above except in that a case 48 is disposed on a rear side of a panel assembly 12 that is